

L3 ANSWER 64 OF 154 CA COPYRIGHT 2005 ACS on STN  
 AN 136:314133 CA  
 ED Entered-STN: 09 May 2002  
 TI Systems and processes for removal of pollutants from a gas stream  
 IN Pahlman, John E.; Carlton, Steve C.; Huff, Ray V.; Hammel, Charles F.;  
 Boren, Richard M.; Kronbeck, Kevin P.; Larson, Joshua E.; Tuzinski,  
 Patrick A.; Axen, Steve G.  
 PA Enviroscrub Technologies Corporation, USA  
 SO PCT Int. Appl., 88 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC B01D053-50; B01D053-56  
 CC 59-4 (Air Pollution and Industrial Hygiene)  
 Section cross-reference(s): 19, 50

FAN.CNT 9

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002028513	A2	20020411	WO 2001-US28473	20010913
	WO 2002028513	A3	20030925		
	WO 2002028513	C1	20031120		
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,				
	CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,				
	GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,				
	LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL,				
	PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG,				
	UZ, VN, YU, ZA, ZW				
	RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AM, AZ, BY, KG,				
	KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR,				
	IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN,				
	GQ, GW, ML, MR, NE, SN, TD, TG				
	AU 2001090802	A5	20020415	AU 2001-90802	20010911
	CA 2424120	AA	20020411	CA 2001-2424120	20010913
	EP 1363720	A2	20031126	EP 2001-970845	20010913
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,				
	IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	US 2003157008	A1	20030821	US 2002-252270	20020923
PRAI	US 2000-238105P	P	20001004		
	US 2000-239422P	P	20001010		
	US 2000-239435P	P	20001010		
	US 2000-242830P	P	20001023		
	US 2000-243090P	P	20001024		
	US 2000-244948P	P	20001101		
	US 2001-288165P	P	20010502		
	US 2001-288166P	P	20010502		
	US 2001-288167P	P	20010502		
	US 2001-288168P	P	20010502		
	US 2001-288237P	P	20010502		
	US 2001-288242P	P	20010502		
	US 2001-288243P	P	20010502		
	US 2001-288245P	P	20010502		
	US 2001-295930P	P	20010605		
	US 2001-296003P	P	20010605		
	US 2001-296004P	P	20010605		
	US 2001-296005P	P	20010605		
	US 2001-296006P	P	20010605		
	US 2001-296007P	P	20010605		
	US 2000-222236P	P	20000801		
	US 2000-232049P	P	20000912		
	US 2000-232097P	P	20000912		
	US 2001-238245P	P	20010502		
	US 2001-299362P	P	20010619		
	US 2001-299363P	P	20010619		

US 2001-919600	A	20010731
WO 2001-US24130	W	20010801
WO 2001-US28414	W	20010911
WO 2001-US28473	W	20010913
US 2001-24130	A	20011217
US 2002-44089	A1	20020111

# CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2002028513	IC	B01D053-50IC B01D053-56
US 2003157008	ECLA	B01D053/04; B01D053/06; B01D053/50D; B01D053/56D; B01D053/64; B01D053/83; B01D053/86B4; B01D053/86F2C; B01D053/86N

- AB The invention relates to the systems and processes for removal of pollutants, such as sulfur oxides, nitrogen oxides, and **carbon** oxides, totally reduced sulfides, **fly ash**, mercury compds., and elemental mercury from gases generated from the burning of fossil fuels and other process gases with electronic control of operational parameters such as, differential pressure across the system, gas temp., and removal efficiency. The systems and processes of the invention employ **manganese** oxides as the primary sorbent to effect removal of pollutants, such as sulfur oxides and/or nitrogen oxides, and may further employ other sorbent materials and chem. additives sep. and in conjunction with **manganese** oxides to effect the removal of other target pollutants, e.g., using alumina to remove mercury. In wet removal, **manganese** oxides are mixed in a slurry which is introduced into reaction zones of the system. In dry removal, **manganese** oxides are introduced from feeders into reaction zones of the system where they are contacted with a gas from which pollutants are to be removed. Removal may occur in single-stage, dual-stage, or multi-stage systems with at least one of the reaction zones being a wet scrubber. A variety dry scrubbers may be utilized in combination wet and dry removal systems. Reacted sorbent may be removed from the reaction action zones for recycling or recycled or regenerated with useful and marketable byproducts being recovered during regeneration.
- ST **manganese** oxide absorbent regeneration flue gas treatment; sulfur oxide nitrogen oxide removal flue gas **manganese** oxide; **carbon** monoxide dioxide removal flue gas **manganese** oxide scrubbing; mercury removal flue gas alumina; nitrate sulfate **carbon** dioxide mercury recovery flue gas
- IT Scrubbers  
(dry; component of systems and processes employing **manganese** oxides as primary sorbents for pollutant removal from gas stream)
- IT Process control  
(electronic control of operational parameters; systems and processes employing **manganese** oxides as primary sorbents for removal of pollutants from gas stream)